

**Strictly Confidential: (For Internal and Restricted use only)**  
**Senior School Certificate Examination-2020**  
**Marking Scheme – CHEMISTRY**  
**(SUBJECT CODE -043) (PAPER CODE – 56/4/1,2,3)**

**General Instructions: -**

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully. **Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best efforts in this process.**
2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them.**
3. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
4. Evaluators will mark(  $\checkmark$  ) wherever answer is correct. For wrong answer 'X' be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
5. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
6. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
7. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
8. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
9. A full scale of marks **0-70** has to be used. Please do not hesitate to award full marks if the answer deserves it.
10. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
11. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
  - Leaving answer or part thereof unassessed in an answer book.
  - Giving more marks for an answer than assigned to it.
  - Wrong totaling of marks awarded on a reply.
  - Wrong transfer of marks from the inside pages of the answer book to the title page.
  - Wrong question wise totaling on the title page.
  - Wrong totaling of marks of the two columns on the title page.
  - Wrong grand total.
  - Marks in words and figures not tallying.
  - Wrong transfer of marks from the answer book to online award list.
  - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
  - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
12. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.

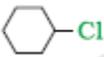
13. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
16. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

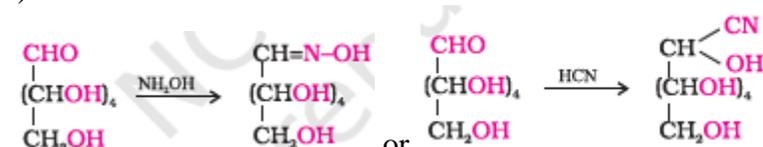
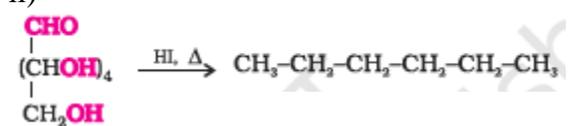
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**MARKING SCHEME**

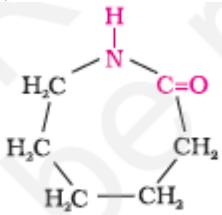
**SR. SECONDARY SCHOOL EXAMINATION, 2020**

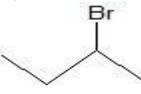
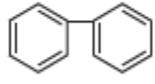
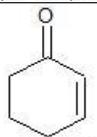
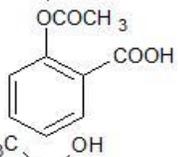
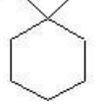
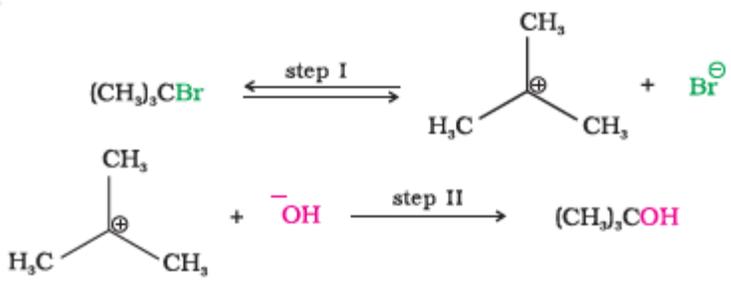
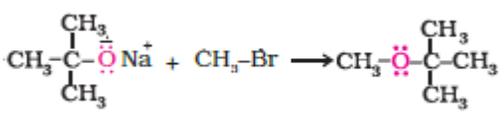
**Subject: CHEMISTRY**

Q.No.	Expected Answer / Value Points	Distribution of Marks
<b>SECTION - A</b>		
1.	Due to preferential adsorption of common ions from solution / due to electron capture by sol particles during electrodispersion of metal/ due to formulation of electrical double layer	1
2.	Due to repulsion between the particles of similar charge.	1
3.	Due to preferential adsorption of $\Gamma^-$ from dispersion medium.	1
4.	By electrophoresis / by mixing two oppositely charged sols / by boiling / by persistent dialysis / by addition of electrolyte.	1
5.	$K_2SO_4$	1
6.	Leaching / Baeyer's process	1
7.		1
8.	$CH_3-CH_2-CH_2-NH_2$	1
9.	Luminal	1
10.	Amylose	1
11.	(c)	1
12.	(d)	1
13.	(c)	1
14.	(c)	1
15.	(b)	1
16.	(B)	1
17.	(A)	1
18.	(D)	1
19.	(A)	1
20.	(C)	1
<b>SECTION - B</b>		
21.	(i) Reverse osmosis occurs. (ii) Solution shows positive deviation from Raoult's Law.	1 1

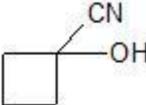
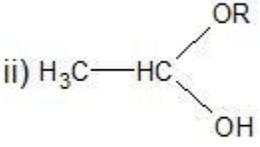
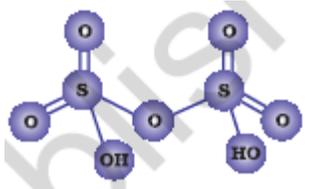
22.	(a) The metal is converted into its volatile compound which is collected and decomposed to give pure metal. (b) Different components of a mixture are adsorbed to different extent on an adsorbent.	1 1
	<b>OR</b>	
22.	(i) $2\text{Cu}_2\text{S} + 3\text{O}_2 \longrightarrow 2\text{Cu}_2\text{O} + 2\text{SO}_2$ $2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \longrightarrow 6\text{Cu} + \text{SO}_2 / \text{Cu}_2\text{O} + \text{C} \longrightarrow 2\text{Cu} + \text{CO}$	$\frac{1}{2}$ $\frac{1}{2}$
	(ii) $2[\text{Ag}(\text{CN})_2]^-_{(\text{aq.})} + \text{Zn}_{(\text{s})} \longrightarrow 2\text{Ag}_{(\text{s})} + [\text{Zn}(\text{CN})_4]^{2-}_{(\text{aq.})}$	1
23.	$2\text{MnO}_2 + 4\text{KOH} + \text{O}_2 \longrightarrow 2\text{K}_2\text{MnO}_4 + 2\text{H}_2\text{O}$ $3\text{MnO}_4^{2-} + 4\text{H}^+ \longrightarrow 2\text{MnO}_4^- + \text{MnO}_2 + 2\text{H}_2\text{O} /$ $\text{MnO}_4^{2-} \xrightarrow[\text{oxidation}]{\text{Electrolytic}} \text{MnO}_4^- + \text{e}^-$	1 1
	<b>OR</b>	
23.	$\text{Cr}_2\text{O}_7^{2-} + 6\text{Fe}^{2+} + 14\text{H}^+ \longrightarrow 2\text{Cr}^{3+} + 6\text{Fe}^{3+} + 7\text{H}_2\text{O}$ $\text{Cr}_2\text{O}_7^{2-} + 3\text{Sn}^{2+} + 14\text{H}^+ \longrightarrow 2\text{Cr}^{3+} + 3\text{Sn}^{4+} + 7\text{H}_2\text{O}$	1 1
24.	(i) Tetracyanonickelate(II) / Tetracyanonickelate(II) $\text{dsp}^2$ (ii) Hexaaquairon(II) $\text{sp}^3\text{d}^2$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
25.	(i) A chemical substance which in low concentrations inhibits the growth or destroys microorganisms. eg: Pencillin / Ofloxacin / Chloramphenicol / Tetracycline (ii) Antiseptics are the chemical substances applied to the living tissues which prevent the growth or kill the microorganisms. eg: Dettol / Furacine / Soframycine.  (or any other suitable example)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
26.	i)  ii) 	1 1
27.	The partial pressure of the gas in vapour phase (p) is directly proportional to the mole fraction of gas(x) in the solution.  $p = K_H \cdot x$ $x = \frac{p}{K_H}$ $x = \frac{760}{1.25 \times 10^6}$ $= 6.08 \times 10^{-4}$	1  $\frac{1}{2}$  $\frac{1}{2}$

## SECTION - C

28.	$\Delta T_f = i K_f m$ $\Delta T_f = i \times K_f \times \frac{w_B \times 1000}{MB \times w_A}$ $2.94 = i \times 4.9 \times \frac{5 \times 1000}{122 \times 35}$ $i = 0.512$ $\alpha = \frac{i - 1}{\frac{1}{n} - 1}$ $\alpha = \frac{0.512 - 1}{\frac{1}{2} - 1}$ $= 0.976$ $= 97.6\%$	<p>1/2</p> <p>1/2</p> <p>1/2</p> <p>1</p>
29.	$k = A e^{-E_a/RT}$ $k = (2.5 \times 10^{14} \text{ s}^{-1}) e^{(-25000 \text{ K}/T)}$ $\frac{-E_a}{RT} = \frac{-25000 \text{ K}}{T}$ $\frac{E_a}{R} = 25000 \text{ K}$ $E_a = 25000 \times R$ $= 25000 \times 8.314 \text{ J/mol}$ $= 207850 \text{ J/mol or } 207.85 \text{ kJ/mol}$ $t_{\frac{1}{2}} = \frac{0.693}{k}, k = \frac{0.693}{t_{\frac{1}{2}}}$ $k = \frac{0.693}{300 \text{ min}}$ $= 0.00231 \text{ min}^{-1}$	<p>1/2</p> <p>1/2</p> <p>1</p> <p>1</p>
30.	<p>i)</p>  <p>Caprolactam / Aminocaproic acid and <math>\text{NH}_2(\text{CH}_2)_5\text{COOH}</math></p> <p>ii) <math>\text{CH}_2=\text{CH}-\text{Cl}</math>, Vinyl Chloride or Chloroethene</p> <p>iii) <math>\text{CH}_2=\overset{\text{Cl}}{\text{C}}-\text{CH}=\text{CH}_2</math>, Chloroprene or 2-Chlorobuta-1,3-diene.</p>	<p>1/2 + 1/2</p> <p>1/2 + 1/2</p> <p>1/2 + 1/2</p>
31.	<p>(i) <math>\text{Cr}^{2+}</math>, because the stable state of chromium is +3 due to <math>t_{2g}^3</math> configuration.</p> <p>(ii) <math>\text{Cu}^+_{(\text{aq})}</math>, due to more negative <math>\Delta_{\text{hyd}}\text{H}^\circ</math> of <math>\text{Cu}^{2+}_{(\text{aq})}</math> than <math>\text{Cu}^+_{(\text{aq})}</math> / It undergoes</p>	<p>1</p> <p>1</p>

	disproportionation. (iii) $\text{Mn}^{3+}$ , because the most stable state of manganese is +2 due to half filled configuration / $3d^5$ .	1
32.	i) $(\text{CH}_3)_3\text{C}-\text{C}(\text{CH}_3)=\text{CHCH}_3$ ii)  iii) A =  , B = $\text{C}_6\text{H}_5\text{MgBr}$	1 1 $\frac{1}{2} + \frac{1}{2}$
32.	<b>OR</b> i) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 \xrightarrow{\text{HBr / Peroxide}} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{Br}$ $\downarrow \text{NaI / dry acetone}$ $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{I}$ ii) $\text{C}_6\text{H}_6 \xrightarrow[\text{AlCl}_3(\text{anhyd.})]{\text{CH}_3\text{COCl}} \text{C}_6\text{H}_5\text{COCH}_3$ iii) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{PCl}_5} \text{CH}_3\text{CH}_2\text{Cl} \xrightarrow{\text{KCN}} \text{CH}_3\text{CH}_2\text{CN}$  (or by any other method of conversion)	1 1 1
33.	(i) $\text{C}_6\text{H}_5\text{NH}_2 < (\text{CH}_3)_2\text{NH} < \text{CH}_3\text{NH}_2$ (ii) $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N}$ (iii) $(\text{C}_2\text{H}_5)_3\text{N} < (\text{C}_2\text{H}_5)_2\text{NH} < \text{C}_2\text{H}_5\text{NH}_2$	1 1 1
34.	i)  ii)  iii) 	1 1 1
34.	<b>OR</b> a)  b) 	1 1 1



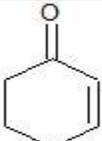
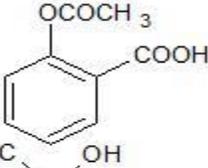
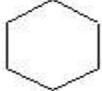
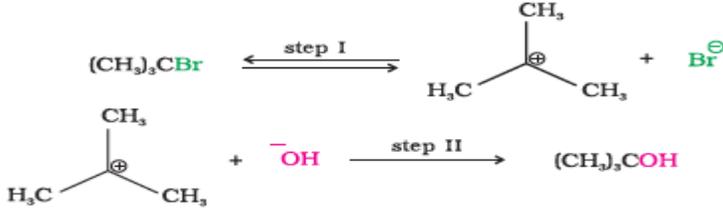
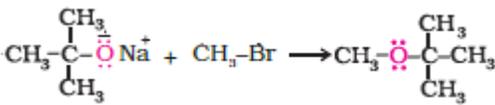
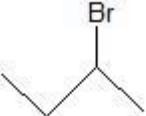
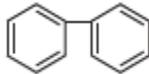
36.	<p>a)</p> <p>i) </p> <p>ii) </p> <p>b) i) <math>\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{CH}_2-\text{CHO}</math></p> <p>ii) <math>\text{CH}_3\text{CHO}</math></p> <p>(c) On heating with <math>\text{NaOH} + \text{I}_2</math>, propanone gives yellow ppt. of <math>\text{CHI}_3</math> while propanal doesn't. (Or any other suitable chemical test)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
37.	<p>(a) (i) Because of decrease in electronegativity / increase in metallic character.  (ii) Due to decrease in bond dissociation enthalpy from HF to HI.  (iii) Sulphur is more stable in +6 oxidation state.</p> <p>(b)</p> <p></p> <p>(c) <math>2\text{XeF}_2 + 2\text{H}_2\text{O} \longrightarrow 2\text{Xe} + 4\text{HF} + \text{O}_2</math></p> <p style="text-align: center;"><b>OR</b></p> <p>(a) (i) <math>\text{H}_2\text{Te}</math>, because of low bond dissociation enthalpy  (ii) <math>\text{H}_2\text{O}</math>, because of small size and high electronegativity of oxygen, bond pair-bond pair repulsion is more.  (iii) <math>\text{H}_2\text{O}</math>, because of high bond dissociation enthalpy.</p> <p>(b) <math>\text{S} + 2\text{H}_2\text{SO}_4 \longrightarrow 3\text{SO}_2 + 2\text{H}_2\text{O}</math>  <math>\text{Cl}_2 + \text{NaOH} \longrightarrow \text{NaCl} + \text{NaOCl} + \text{H}_2\text{O}</math>  (Cold and dilute)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p>1</p> <p>1</p>

56/4/2  
**MARKING SCHEME**  
**SR. SECONDARY SCHOOL EXAMINATION, 2020**  
**Subject: CHEMISTRY**

Q.No.	Expected Answer / Value Points	Distribution of Marks
<b>SECTION - A</b>		
1.	Due to preferential adsorption of common ions from solution / due to electron capture by sol particles during electrodispersion of metal/ due to formulation of electrical double layer.	1
2.	Due to repulsion between the particles of similar charge.	1
3.	Due to preferential adsorption of $\Gamma^-$ from dispersion medium.	1
4.	By electrophoresis / by mixing two oppositely charged sols / by boiling / by persistent dialysis / by addition of electrolyte.	1
5.	$K_2SO_4$	1
6.	$NaCN$	1
7.	$C_6H_5CH_2Cl$	1
8.	$CH_3-OH$	1
9.	Codeine	1
10.	Glycosidic linkage	1
11.	(b)	1
12.	(c)	1
13.	(d)	1
14.	(c)	1
15.	(c)	1
16.	(B)	1
17.	(A)	1
18.	(C)	1
19.	(A)	1
20.	(C)	1
<b>SECTION - B</b>		
21.	$2MnO_2 + 4KOH + O_2 \longrightarrow 2K_2MnO_4 + 2H_2O$ $3MnO_4^{2-} + 4H^+ \longrightarrow 2MnO_4^- + MnO_2 + 2H_2O$ / $MnO_4^{2-} \xrightarrow[\text{oxidation}]{\text{Electrolytic}} MnO_4^- + e^-$	1 1
	<b>OR</b>	
21.	$Cr_2O_7^{2-} + 6Fe^{2+} + 14H^+ \longrightarrow 2Cr^{3+} + 6Fe^{3+} + 7H_2O$ $Cr_2O_7^{2-} + 3Sn^{2+} + 14H^+ \longrightarrow 2Cr^{3+} + 3Sn^{4+} + 7H_2O$	1 1
22.	(i) Reverse osmosis occurs. (ii) Solution shows positive deviation from Raoult's Law.	1 1
23.	(i) Tetracarbonylnickel(0) $sp^3$ (ii) Hexafluoridocobaltate(III) $sp^3d^2$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$



	$t_{\frac{1}{2}} = \frac{0.693}{K}, k = \frac{0.693}{t_{\frac{1}{2}}}$ $k = \frac{0.693}{300 \text{ min}}$ $= 0.00231 \text{ min}^{-1}$	1
29.	(i) $\text{Cr}^{2+}$ , because the stable state of chromium is +3 due to $t_{2g}^3$ configuration. (ii) $\text{Cu}^{+}_{(\text{aq})}$ , due to more negative $\Delta_{\text{hyd}}\text{H}^{\circ}$ of $\text{Cu}^{2+}_{(\text{aq})}$ than $\text{Cu}^{+}_{(\text{aq})}$ / It undergoes disproportionation. (iii) $\text{Mn}^{3+}$ , because the most stable state of manganese is +2 due to half filled configuration / $3d^5$ .	1 1 1
30.	$\Delta T_f = i K_f m$ $\Delta T_f = i \times K_f \times \frac{w_B \times 1000}{MB \times w_A}$ $2.94 = i \times 4.9 \times \frac{5 \times 1000}{122 \times 35}$ $i = 0.512$ $\alpha = \frac{i - 1}{\frac{1}{n} - 1}$ $\alpha = \frac{0.512 - 1}{\frac{1}{2} - 1}$ $= 0.976$ $= 97.6\%$	$\frac{1}{2}$  $\frac{1}{2}$ $\frac{1}{2}$  $\frac{1}{2}$  1
31.	(i) Adipic acid and Hexamethylene diamine $\text{HOOC}(\text{CH}_2)_4\text{COOH} \quad n \quad \text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$ (ii) $\text{HOH}_2\text{C}-\text{CH}_2\text{OH} \quad \text{HOOC}-\text{C}_6\text{H}_4-\text{COOH}$ Ethylene glycol (Ethane-1, 2 - diol)      Terephthalic acid (Benzene-1,4 - di carboxylic acid) (iii) $\text{CH}_3-\overset{\text{OH}}{\text{CH}}-\text{CH}_2-\text{COOH} \quad \text{CH}_3-\text{CH}_2-\overset{\text{OH}}{\text{CH}}-\text{CH}_2-\text{COOH}$ 3-Hydroxybutanoic acid      3-Hydroxypentanoic acid	$\frac{1}{2} + \frac{1}{2}$  $\frac{1}{2} + \frac{1}{2}$  $\frac{1}{2} + \frac{1}{2}$
32.	(i) $\text{C}_6\text{H}_5\text{NH}_2 < (\text{CH}_3)_2\text{NH} < \text{CH}_3\text{NH}_2$ (ii) $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N}$ (iii) $(\text{C}_2\text{H}_5)_3\text{N} < (\text{C}_2\text{H}_5)_2\text{NH} < \text{C}_2\text{H}_5\text{NH}_2$	1 1 1

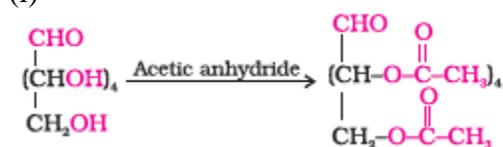
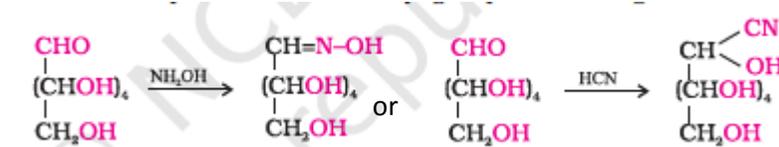
33.	<p>i) </p> <p>ii) </p> <p>iii) </p> <p style="text-align: center;"><b>OR</b></p> <p>a) </p> <p>b) </p>	1 1 1 1
34.	<p>i) <math>(\text{CH}_3)_3\text{C}-\text{C}(\text{CH}_3)=\text{CHCH}_3</math></p> <p>ii) </p> <p>iii) A =  , B = <math>\text{C}_6\text{H}_5\text{MgBr}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>i) <math>\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 \xrightarrow{\text{HBr / Peroxide}} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{Br}</math>  <math>\downarrow \text{NaI / dry acetone}</math>  <math>\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{I}</math></p> <p>ii) <math>\text{C}_6\text{H}_6 \xrightarrow[\text{AlCl}_3(\text{anhyd.})]{\text{CH}_3\text{COCl}} \text{C}_6\text{H}_5\text{COCH}_3</math></p> <p>iii) <math>\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{PCl}_5} \text{CH}_3\text{CH}_2\text{Cl} \xrightarrow{\text{KCN}} \text{CH}_3\text{CH}_2\text{CN}</math></p>	1 1 $\frac{1}{2} + \frac{1}{2}$ 1 1 1

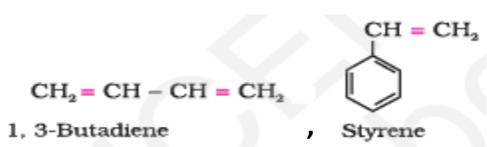
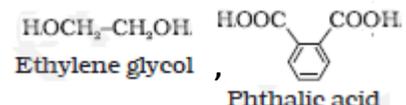
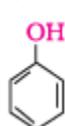


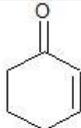
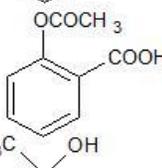
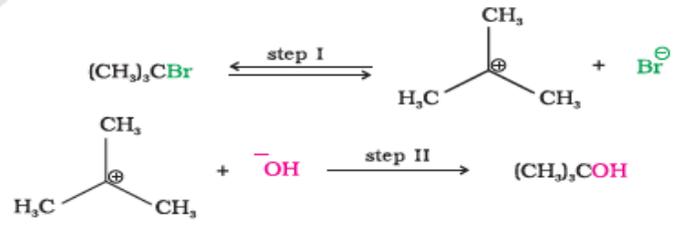
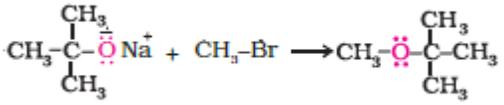
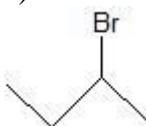
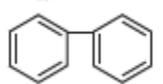


56/4/3  
**MARKING SCHEME**  
**SR. SECONDARY SCHOOL EXAMINATION, 2020**  
**Subject: CHEMISTRY**

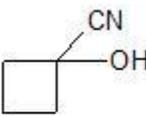
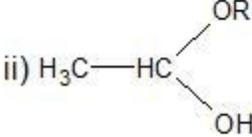
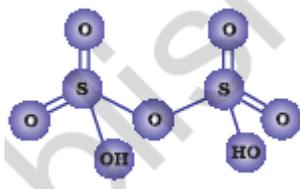
Q.No.	Expected Answer / Value Points	Distribution of Marks
<b>SECTION - A</b>		
1.	Due to preferential adsorption of common ions from solution / due to electron capture by sol particles during electrodispersion of metal/ due to formulation of electrical double layer.	1
2.	Due to repulsion between the particles of similar charge.	1
3.	Due to preferential adsorption of $\Gamma$ from dispersion medium.	1
4.	By electrophoresis / by mixing two oppositely charged sols / by boiling / by persistent dialysis / by addition of electrolyte.	1
5.	$K_2SO_4$	1
6.	Distillation / Electrolytic refining	1
7.	$CH_2=CH-CH_2Cl$	1
8.	$(CH_3)_3N$	1
9.	Fibrous Proteins	1
10.	Bithionol / Bithional	1
11.	(c)	1
12.	(a)	1
13.	(b)	1
14.	(c)	1
15.	(b)	1
16.	(D)	1
17.	(C)	1
18.	(D)	1
19.	(A)	1
20.	(B)	1
<b>SECTION – B</b>		
21.	(a) The metal is converted into its volatile compound which is collected and decomposed to give pure metal.	1
	(b) Different components of a mixture are adsorbed to different extent on an adsorbent.	1
<b>OR</b>		
21.	(i) $2Cu_2S + 3O_2 \longrightarrow 2Cu_2O + 2SO_2$ $2Cu_2O + Cu_2S \longrightarrow 6Cu + SO_2 / Cu_2O + C \longrightarrow 2Cu + CO$	1/2 1/2
	(ii) $2[Ag(CN)_2]^-_{(aq)} + Zn_{(s)} \longrightarrow 2Ag_{(s)} + [Zn(CN)_4]^{2-}_{(aq)}$	1
22.	(i) Reverse osmosis occurs.	1
	(ii) Solution shows positive deviation from Raoult's Law.	1

23.	i) Hexaamminecobalt(III) $d^2sp^3$ ii) Tetrachloridonickelate (II) $sp^3$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
24.	$2MnO_2 + 4KOH + O_2 \longrightarrow 2K_2MnO_4 + 2H_2O$ $3MnO_4^{2-} + 4H^+ \longrightarrow 2MnO_4^- + MnO_2 + 2H_2O /$ $MnO_4^{2-} \xrightarrow[\text{oxidation}]{\text{Electrolytic}} MnO_4^- + e^-$ <b>OR</b>	1 1
24.	$Cr_2O_7^{2-} + 6Fe^{2+} + 14H^+ \longrightarrow 2Cr^{3+} + 6Fe^{3+} + 7H_2O$ $Cr_2O_7^{2-} + 3Sn^{2+} + 14H^+ \longrightarrow 2Cr^{3+} + 3Sn^{4+} + 7H_2O$	1 1
25.	(i)  ii) 	1 1
26.	The partial pressure of the gas in vapour phase (p) is directly proportional to the mole fraction of gas(x) in the solution. $p = K_H \cdot x$ $x = \frac{p}{K_H}$ $x = \frac{760}{1.25 \times 10^6}$ $= 6.08 \times 10^{-4}$	1 $\frac{1}{2}$ $\frac{1}{2}$
27.	i) Chemical substances used for the treatment of hyperacidity in the stomach Example: $Al(OH)_3 / Mg(OH)_2 / NaHCO_3$ (or any other suitable example) ii) Chemical substances used to provide sweetness to food with low calories Example: Sucralose / Saccharin / Aspartame (or any other suitable example)	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
<b>SECTION - C</b>		
28.	(i) $Cr^{2+}$ , because the stable state of chromium is +3 due to $t_{2g}^3$ configuration. (ii) $Cu^+_{(aq)}$ , due to more negative $\Delta_{hyd}H^O$ of $Cu^{2+}_{(aq)}$ than $Cu^+_{(aq)}$ / It undergoes disproportionation. (iii) $Mn^{3+}$ , because the most stable state of manganese is +2 due to half filled configuration / $3d^5$ .	1 1 1
29.	$\Delta T_f = i K_f m$ $\Delta T_f = i \times K_f \times \frac{w_B \times 1000}{M_B \times w_A}$ $2.94 = i \times 4.9 \times \frac{5 \times 1000}{122 \times 35}$ $i = 0.512$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

	$\alpha = \frac{i-1}{\frac{1}{n}-1}$ $\alpha = \frac{0.512-1}{\frac{1}{2}-1}$ $= 0.976$ $= 97.6\%$	<p>1/2</p> <p>1</p>
30.	$k = A e^{-E_a/RT}$ $k = (2.5 \times 10^{14} \text{ s}^{-1}) e^{(-25000 \text{ K}/T)}$ $\frac{-E_a}{RT} = \frac{-25000 \text{ K}}{T}$ $\frac{E_a}{R} = 25000 \text{ K}$ $E_a = 25000 \times R$ $= 25000 \times 8.314 \text{ J/mol}$ $= 207850 \text{ J/mol or } 207.85 \text{ kJ/mol}$ $t_{\frac{1}{2}} = \frac{0.693}{k}, k = \frac{0.693}{t_{\frac{1}{2}}}$ $k = \frac{0.693}{300 \text{ min}}$ $= 0.00231 \text{ min}^{-1}$	<p>1/2</p> <p>1/2</p> <p>1</p> <p>1</p>
31.	<p>(a)</p> <p style="text-align: center;"> <math>\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2</math>      <math>\text{CH} = \text{CH}_2</math>    1, 3-Butadiene      ,      Styrene </p> <p>(b)</p> <p style="text-align: center;"> <math>\text{HOCH}_2 - \text{CH}_2 - \text{OH}</math>      <math>\text{HOOC}</math>      <math>\text{COOH}</math>    Ethylene glycol      ,      Phthalic acid </p> <p>(c)</p> <p style="text-align: center;">  , HCHO ; Phenol and formaldehyde </p>	<p>1/2 x 6</p>

32.	<p>i) </p> <p>ii) </p> <p>iii) </p> <p style="text-align: center;"><b>OR</b></p> <p>a) </p> <p>b) </p>	1 1 1 1 1
33.	<p>i) <math>(\text{CH}_3)_3\text{C}-\text{C}(\text{CH}_3)=\text{CHCH}_3</math></p> <p>ii) </p> <p>iii) A = , B = <math>\text{C}_6\text{H}_5\text{MgBr}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>i) <math>\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 \xrightarrow{\text{HBr / Peroxide}} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{-Br}</math>  <math>\downarrow \text{NaI / dry acetone}</math>  <math>\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{-I}</math></p> <p>ii) <math>\text{C}_6\text{H}_6 \xrightarrow[\text{AlCl}_3(\text{anhyd.})]{\text{CH}_3\text{COCl}} \text{C}_6\text{H}_5\text{COCH}_3</math></p> <p>iii) <math>\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{PCl}_5} \text{CH}_3\text{CH}_2\text{Cl} \xrightarrow{\text{KCN}} \text{CH}_3\text{CH}_2\text{CN}</math></p>	1 1 $\frac{1}{2} + \frac{1}{2}$ 1 1 1
34.	<p>(i) <math>\text{C}_6\text{H}_5\text{NH}_2 &lt; (\text{CH}_3)_2\text{NH} &lt; \text{CH}_3\text{NH}_2</math></p> <p>(ii) <math>(\text{CH}_3)_2\text{NH} &gt; \text{CH}_3\text{NH}_2 &gt; (\text{CH}_3)_3\text{N}</math></p> <p>(iii) <math>(\text{C}_2\text{H}_5)_3\text{N} &lt; (\text{C}_2\text{H}_5)_2\text{NH} &lt; \text{C}_2\text{H}_5\text{NH}_2</math></p>	1 1 1

**SECTION – D**

<p>35.</p>	<p>a) A = CH<sub>3</sub>COCH<sub>2</sub>CH<sub>3</sub>            B = CH<sub>3</sub>CHOHCH<sub>2</sub>CH<sub>3</sub>            C = CH<sub>3</sub>CH=CHCH<sub>3</sub></p> $\text{CH}_3\text{COCH}_2\text{CH}_3 \xrightarrow{\text{NaOH} + \text{I}_2} \text{CHI}_3 + \text{CH}_3\text{CH}_2\text{COONa}$ $\text{CH}_3\text{COCH}_2\text{CH}_3 \xrightarrow{\text{NaBH}_4} \text{CH}_3\text{CHOHCH}_2\text{CH}_3$ <p>b) i) Cleavage of C-H bond in propanal is easier than C-C bond in propanone.            ii) Due to resonance stabilization of conjugate base / enolate ion or structural representation.</p> <p align="center"><b>OR</b></p> <p>35.</p> <p>a)</p> <p>i) </p> <p>ii) </p> <p>b) i) H<sub>3</sub>C—CH=CH—CH<sub>2</sub>—CHO            ii) CH<sub>3</sub>CHO</p> <p>(c) On heating with NaOH + I<sub>2</sub>, propanone gives yellow ppt. of CHI<sub>3</sub> while propanal doesn't. (Or any other suitable chemical test)</p>	<p>½ ½ ½ 1 ½ 1 1 <b>OR</b> 1 1 1 1 1 1 1</p>
<p>36.</p>	<p>(a) (i) Because of decrease in electronegativity / increase in atomic size / increase in metallic character.            (ii) Due to decrease in bond dissociation enthalpy from HF to HI.            (iii) Sulphur is more stable in +6 oxidation state.</p> <p>(b)</p> <p></p> <p>(c) <math>2\text{XeF}_2 + 2\text{H}_2\text{O} \longrightarrow 2\text{Xe} + 4\text{HF} + \text{O}_2</math></p> <p align="center"><b>OR</b></p> <p>36.</p> <p>(a) (i) H<sub>2</sub>Te, because of low bond dissociation enthalpy            (ii) H<sub>2</sub>O, because of small size and high electronegativity of oxygen, bond pair–bond pair repulsion is more.            (iii) H<sub>2</sub>O, because of high bond dissociation enthalpy.</p> <p>(b) <math>\text{S} + 2\text{H}_2\text{SO}_4 \longrightarrow 3\text{SO}_2 + 2\text{H}_2\text{O}</math>  <math>\text{Cl}_2 + \text{NaOH} \longrightarrow \text{NaCl} + \text{NaOCl} + \text{H}_2\text{O}</math>            (Cold and dilute)</p>	<p>1 1 1  1  1 <b>OR</b> ½ + ½ ½ + ½ ½ + ½ 1 1</p>

